भारतीय मानक
Indian Standard

IS 13630 (Part 4) : 2019

सिरैमिक टाइलें — परिक्षण पद्धतियां, नमूने लेने तथा स्वीकार्यता का आधार

भाग 4 रैखिक थर्मल विस्तार ज्ञात करना

(दूसरा पुनरीक्षण)

Ceramic Tiles — Methods of Test, Sampling and Basis for Acceptance

Part 4 Determination of Linear Thermal Expansion

(Second Revision)

ICS 91.100.23

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Flooring, Wall Finishing and Roofing Sectional Committee, CED 05

FOREWORD

This Indian Standard (Part 4) (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Flooring, Wall Finishing and Roofing Sectional Committee had been approved by the Civil Engineering Division Council.

This standard (Part 4) was first published in 1992 and subsequently revised in 2006. This second revision incorporates the experience gained with the use of this standard and brings the standard in line with the latest developments in this field.

This revision incorporates the modified rate of heating.

This Indian Standard is published in several parts. The other parts in this series are:

Part 1	Determination of dimensions and surface quality
Part 2	Determination of water absorption and bulk density
Part 3	Determination of moisture expansion using boiling water
Part 5	Determination of resistance to thermal shock
Part 6	Determination of modulus of rupture and breaking strength
Part 7	Determination of stain and chemical resistance of unglazed tiles
Part 8	Determination of stain and chemical resistance of glazed tiles
Part 9	Determination of crazing resistance of glazed tiles
Part 10	Determination of frost resistance
Part 11	Determination of resistance to surface abrasion of glazed tiles
Part 12	Determination of resistance to deep abrasion of unglazed tiles
Part 13	Determination of scratch hardness of surface according to Mohs' scale
Part 14	Determination of impact resistance by measurement of coefficient of restitution
Part 15	Sampling and basis for acceptance
Part 16	Determinations of lead and cadmium given off by glazed tiles

In the formulation of this standard considerable assistance has been derived from the ISO 10545-8 : 2014 'Ceramic tiles — Part 8: Determination of linear thermal expansion'.

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

Indian Standard

CERAMIC TILES — METHODS OF TEST SAMPLING AND BASIS FOR ACCEPTANCE

PART 4 DETERMINATION OF LINEAR THERMAL EXPANSION

(Second Revision)

1 SCOPE

This standard (Part 4) covers a method of test for determining the coefficient of linear thermal expansion of all ceramic tiles.

2 PRINCIPLE

The coefficient of linear thermal expansion is determined for the temperature range from ambient temperature to 100°C.

3 APPARATUS

3.1 Suitable Calibrated Thermal Expansion Apparatus — The apparatus should be capable of heating at the rate of (5 ± 1)°C/min with uniform distribution of heat to a test specimen. Certain types of apparatus require a soaking time at 100°C.

3.2 Vernier Calipers

3.3 Drying Oven — Capable of operating at 110 ± 5°C. Microwave, infrared or other drying systems may be used provided that it has been determined that equal results are obtained.

3.4 Desiccator

4 TEST SPECIMENS

4.1 Two test specimens shall be cut at right angles from the central portion of one tile so that their lengths are suitable for the apparatus.

4.2 The end of the test specimens shall be ground flat and parallel.

4.3 If necessary, grind the test specimens so that the length of any side in cross-section is less than 6 mm and the area of cross-section is greater than 10 mm^2. The minimum length of the test specimens should be 25 mm.

4.4 In the case of glazed tiles, the glaze shall be ground off the test specimens or alternatively unglazed tiles fired along with the normal production may be used.

5 PROCEDURE

5.1 Dry the test specimens at 110 ± 5°C until they reach constant mass, that is, when the difference between two successive weighing at intervals of 24 h is less than 0.1 percent. Then allow them to cool in a desiccator at ambient temperature.

5.2 Using Vernier calipers, determine the length to an accuracy of 0.002 times of the length.

5.3 Place a test specimen in the apparatus and note the ambient temperature.

5.4 Initially and throughout the heating procedure, measure the length to an accuracy of 0.01 mm.

5.5 The rate of heating shall be (5 ± 1)°C/min.

6 EXPRESSION OF RESULTS

The coefficient of linear expansion (α) is expressed to the first decimal place x 10^{-6} /°C in accordance with the expression:

$$\alpha = \frac{1}{l_0} \times \frac{\Delta l}{\Delta t}$$

where

l_0 = length of test specimens at the ambient temperature;

Δl = increase in the length of the test specimen; and

Δt = rise in temperature.

7 TEST REPORT

The test report shall contain the following:

a) Brief description of the apparatus;

b) Description of the tiles; and

c) Coefficient of linear thermal expansion for both test specimen.

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

Flooring, Wall Finishing and Roofing Sectional Committee, CED 05

Organization	*Representative(s)*
In Personal Capacity (*L/109, Sarita Vihar, New Delhi*)	Shri Ashok Khurana (***Chairman***)
Ardex Endura India Pvt Ltd, Bengaluru	Shri K. P. Paulson Shri Gopinath Krishnan (*Alternate*)
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CSIR – Central Road Research Institute, New Delhi	Dr Rakesh Kumar
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Morbi Dhuva Glaze Tiles Association, Morbi	Shri Nilesh Jetparia Shri Jeram Madhav Kavar (*Alternate*)
Municipal Corporation of Greater Mumbai, Mumbai	Representative

Organization	*Representative(s)*
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Amendments Issued Since Publication

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